US Army Medical Research and Materiel

Technology Available for Licensing

Pacifier Pulse Oximeter Sensor

This invention provides an apparatus and a method for measuring blood oxygenation levels and pulse rates from locations within the oral cavity of an infant, small child or a small/newborn animal. The invention is a pacifier that contains pulse oximeter sensors which can perform reflective pulse oximetry. The method was tested on pharyngeal, lingual and buccal surfaces. The readings correlated closely with ones taken with transillumination pulse oximetry.

Tradition and technology have favored transillumination pulse oximetry over reflectance pulse oximetry in the operating theater. Transillumination pulse oximetry, without question, is the most effective form when oximetry is obtained through the skin. However, when skin is not interposed as a barrier to capillary bed access, reflectance pulse oximetry can easily be achieved with very accurate results. It is commonly and effectively used among intrapartum and neonatal patients whose capillary beds are easily accessed through their skin. The technique has also been applied to adult and pediatric burn patients by placing the reflectance sensor in wounds or over hyperemic sites such as healed partial thickness burns. The effect is achieved by the backscattering of incident bispectral light that traverses and, on reflection from nonabsorptive collagenous tissues, retraverses [illegible] elements in the blood back to the oximeter [illegible]s.

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For babies and young children who are apt to remove or [illegible] foreign objects such as finger oximeters or inserted [illegible]d for multitrauma and thermally injured patients who have severe peripheral vasoconstriction or severely damaged or missing peripheral vascular beds, the reflectance pulse oximeter sensor provides an alternative to more traditional transillumination oximeters.

Features and advantages:

- **Could be more readily accepted by infants and small children than conventional methods**
- **Could be used for difficult to monitor, severely burned ICU patients**
- **Could be used easily by emergency personnel in the field**
- **Requires less power to function and thus produces less heat than transilluminance pulse oximetry**

Patent Status

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